

### **ABSTRACT OF THE DISCLOSURE**

The present invention relates to a method for manufacturing light-emitting device with compound semiconductor and more particularly, a method for manufacturing light-emitting device with Group III - V compound semiconductor for increasing light-emitting efficiency or long durability of elements, by conducting of a heat-treatment at lower temperature than done at the conventional art, i.e. activating p-semiconductor layer under the condition of high oxygen density, which idea is derived from the well known fact that on the higher oxygen density, the better semiconductor layer doped with p-type such like p-GaN can be activated.

The present invention is a method for manufacturing light-emitting device with compound semiconductor comprising; a first step of forming n-semiconductor layer, an activated layer, a p-semiconductor layer in order on the top of a double substrate, a second step of making a part of the n-semiconductor with that mesa-cut in vertical direction from a p-semiconductor layer to a part of the n-semiconductor, a third step of forming a transparent electrode for extending an electric current on the top of the p-semiconductor layer and activating the p-semiconductor layer under the condition of an oxygen plasma, and a fourth step of forming each of the n-pad electrode and the p-pad electrode on the top of the transparent electrode for extending an electric current.